

Application No. 09/650,626

REMARKS

Claims 1-57 are pending. By this Amendment, claims 13, 14, 16, 17, 24, 27, and 50 are canceled, while claims 1, 11, 12, 18, 19, 23, 44, 48, 49, 51, 52, and 54 are amended.

I. Claim Objections

Claim 25 stands objected to because of incorrect dependency. By this amendment, claim 25 has been amended to depend from independent claim 23. Applicants respectfully request that the objection to claim 25 be withdrawn.

Claim 11 stands objected to because of a grammatical error. By this amendment, claim 11 has been amended to correct said error. Applicants respectfully request that the objection to claim 11 be withdrawn.

Claims 19 and 31-33 stand objected to as depending on a rejected claim. By this amendment, claims 19 and 31 have been canceled. Claims 32 and 33 have been amended to depend from amended independent claim 29 which Applicants believe is in condition for allowance. Applicants respectfully request that the objection to claims 32 and 33 be withdrawn.

II. Claim Rejections 35 USC § 112

Claims 8 and 18 stand rejected under 35 USC § 112, second paragraph, as being vague and indefinite. By this amendment, claim 8 has been amended to correct its dependency. By this amendment, claim 18 has been amended to corrects its dependency and to more clearly define the subject matter claimed by the Applicants. Applicants respectfully request that said rejection to claims 8 and 18 be withdrawn.

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III. Claim Rejections 35 USC § 103

Claims 1-11, 23, 26, 28, 48, 49, 51, and 54-57 stand rejected under 35 USC § 103 as being unpatentable over Williams (U.S. Patent No. 5,754,451) in view of Vines et al. (U.S. Patent No. 6,006,171). The Applicants respectfully traverse said rejection.

With respect to independent claims 1 and 48, the Examiner suggests that Vines et al. discloses a plurality of computer controllers that control a plurality of different virtual machines (i.e., groups of process variables defining subsets of a larger machine). A careful reading of Vines et al. offers no such suggestion. Instead, the language cited by the Examiner merely suggests the use of computer software to link process parameters with the appropriate equipment identifier for the purpose of sharing data between process control software and maintenance management software. Vines et al. discloses that these parameters could include: "selection of process control monitoring station, association of equipment tag names in the maintenance database with process control variables, monitoring type per device, monitoring scan frequencies, warning and action filter limits, selection of system alarm and process alarm devices and condition for generating work order requests." (Col. 4, Lines 9-14) At no point does Vines et al. suggest grouping subsets of process variables to define a virtual machine. As indicated within the specification and previously suggested to the Examiner, the ability to define such virtual machines is a unique and useful characteristic of the present invention in that it allows the user to determine more accurately which operational station or transfer (i.e., virtual machine) is the root cause of a shutdown. By examining a virtual machine as opposed to the entire set of inputs/outputs, which define the actual machine, process, etc., this root cause can be ascertained more quickly and more efficiently. As Vines et al. does not disclose, teach or suggest the concept of a virtual machine, i.e., it does not disclose, teach or suggest the ability to monitor a subset of inputs/outputs, Applicants respectfully suggest that the combination of Williams and Vines et al. fails to teach or suggest the concept of a virtual machine.

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With respect to independent claims 1, 23, and 48, the Examiner suggests that Williams discloses an analysis component that performs analysis on the acquired transition data to automatically, and without user-input, determine, store and display, whether the machine has experienced a downtime event as well as if one of the digital channels intermittently experiences an unexpected transition absent a downtime event wherein the unexpected transition is characterized by a statistically significant deviation. A careful reading of the express language of Williams offers no suggestion for characterizing an unexpected transition as a statistically significant deviation. Williams states, "If a part deviates from its previous transition history, then the preventative maintenance device 10 can flag the part as a potential problem area and alert the operator as indicated by block 86." (Col. 5, Lines 20-23) While block 86 mentions a "deviation beyond predetermined level" (Fig. 5), Williams provides no support as to what this predetermined level would be or how it would be determined. Based on the teaching of Williams, any deviation, be it statistically significant or not, could be enough to flag the part as a potential problem. The present invention expressly requires the unexpected transition to be characterized by a statistically significant deviation as determined by the analysis component. The advantage of the present invention is obvious as it eliminates non-statistically significant deviations, i.e., a valve opening more slowly over time but still within an operable range, from consideration as root cause problems for a downtime event. This point is illustrated in the specification starting at Page 31, second full paragraph and ending on Page 33, second full paragraph. By eliminating non-statistically significant deviations, root cause analysis can be accomplished more quickly and efficiently. As Williams does not disclose, teach or suggest the concept of characterizing an unexpected transition as a statistically significant deviation, Applicants respectfully suggest that the combination of Williams and Vines et al. fails to teach or suggest the concept of characterizing an unexpected transition as a statistically significant deviation.

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Applicants respectfully request that the rejections to independent claims 1, 23, and 48 and those claims depending therefrom, be withdrawn.

Claims 12, 15, 18, 20 and 21 stand rejected under 35 USC § 103 as being unpatentable over Williams in view of Vines et al. and further in view of Seng et al. (U.S. Patent No. 5,870,693). By this amendment, Applicants have amended independent claim 12 to include the subject matter of objected to claim 19. Applicants submit that amended claim 12 is now in condition for allowance. Applicants respectfully request that the rejection to independent 12 and those claims depending therefrom, be withdrawn.

Claims 29, 30, and 37-39 stand rejected under 35 USC § 103 as being unpatentable over Williams in view of Vines et al. and further in view of Imazeki et al. (U.S. Patent No. 4,396,974). By this amendment, Applicants have amended independent claim 29 to include the subject matter of objected to claim 31. Applicants submit that amended claim 29 is now in condition for allowance. Applicants respectfully request that the rejection to independent claim 29 and those claims depending therefrom, be withdrawn.

Claim 22 stands rejected under 35 USC § 103 as being unpatentable over Williams in view of Vines et al. and Sengt et al., and further in view of Elsley (U.S. Patent No. 5,949,676). As discussed previously, Applicants have amended independent claim 12 to place it in condition for allowance. By definition, dependent claim 22 is also allowable. Applicants respectfully request that the rejection to dependent claim 22 be withdrawn.

Claim 25 stands rejected under 35 USC § 103 as being unpatentable over Williams in view of Vines et al. and further in view of Elsley. As previously discussed, Applicants have traversed the rejection to independent claim 23. By definition, dependent claim 25 is also allowable. Applicants respectfully request that the rejection to dependent claim 25 be withdrawn.

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Claims 40-47 stand rejected under 35 USC § 103 as being unpatentable over Williams in view of Vines et al. and Imazeki et al., and further in view of Gaubatz (U.S. Patent No. 5,586,156). Applicants respectfully traverse said rejection. The Examiner has failed to make out a *prima facie* case of obviousness as Gaubatz is neither analogous to the present invention nor is it reasonably pertinent to the particular problem with which the inventor was concerned. Gaubatz is directed to a quad redundant protection system for a nuclear reactor. Gaubatz teaches a system in which the reactor protection system (RPS) is comprised of a 4 division system (Col. 4, Lines 8-10) where redundant sensor systems are verified against one another and a fifth independent software file (Col. 5, Lines 64-66) prior to transitioning to a Start-Up/Operate mode (Col. 6, Lines 2-5). While these are clearly important concerns within the nuclear power industry, they have no relevance to the present invention, especially the comparison of a current sub-set of transition data versus an expected historical pattern of said sub-set of transition data. As the Examiner has admitted the combination of Williams, Vines et al., and Imazeki et al. fails to teach steps relating to a sub-set of transition data, Applicants respectfully request that the rejection to independent claim 40 and those claims depending therefrom, be withdrawn.

Claims 34-36 stand rejected under 35 USC § 103 as being unpatentable over Williams in view of Vines et al. and Imazeki et al., and further in view of Rockwell Software, "RSRules™, Machine Diagnostics." As discussed previously, Applicants have amended independent claim 29 to place it in condition for allowance. By definition, dependent claims 34-36 are also allowable. Applicants respectfully request that the rejection to dependent claims 34-36 be withdrawn.

Claims 52 and 53 stand rejected under 35 USC § 103 as being unpatentable over Williams in view of Vines et al., and further in view of Ohnishi et al. (U.S. Patent No. 5,319,353). As discussed previously, Applicants have traversed the rejection to independent


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claim 48. By definition, dependent claims 52 and 53 are also allowable. Applicants respectfully request that the rejection to dependent claims 52 and 53 be withdrawn.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

  
Kimberly K. Baxter  
Registration No. 40,504

Customer No. 24113  
Patterson, Thuent, Skaar & Christensen, P.A.  
4800 IDS Center  
80 South 8th Street  
Minneapolis, Minnesota 55402-2100  
Telephone: (612) 349-5750

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